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CLEANING AND ARRANGING DIATOMS.

F. S. NEWCOMER, M. D., Indianapolis, Ind.

The subject assigned me for "Half-hour Conversation," is rather a large one for so limited a time,—that of cleaning and arranging diatoms. I will, therefore, confine my remarks to cleaning diatoms found on *Zostera marina*—eelgrass,—a genus of monöostyledonous flowering plants growing in sea-water. On this plant we have the finest specimens of *Arachnoidiscus*, Ehr. I use a test tube ten inches long and one inch and a quarter in diameter; cut the grass into inch lengths for convenience of boiling; and boil and wash out the chloride of sodium; then boil in bicarbonate of sodium, which will break up the fibers of the plant and reduce it to finest shreds; then wash out the soda and pour into a Berlin dish, and evaporate the remaining water. Then add C. P. sulphuric acid until the organic matter is fully and completely charred; then deflagrate with chlorate potassa, or nitrate potassa, the latter preferred and used in the specimen presented; have ready a quart or more of distilled water in a large beaker, and after the acid has cooled, pour into the water gradually, and stirring with a glass rod. When the acid is all washed out, to remove any flocculent material, boil in good clean hard soap, not more than ten grains to the test tube one-fourth full of water (the test tube mentioned above); then wash out all traces of soap and you have your diatoms clean and bright, with possibly a small portion of sand. Your material is then again placed in a Berlin dish, and by rotating the material the diatoms will float to the top, when they are poured off and the sand remains in the bottom of the dish; add more water and repeat as often as may be found necessary. With the sand you will frequently find the largest diatoms. It is, therefore, advisable to keep this sand and diatoms in a separate bottle, as it will yield the finest specimens to "pick" when using the mechanical finger. The material is now preserved in half alcohol and water, and will keep indefinitely. If

this precaution is neglected and water alone used as the preserving fluid your specimen will be spoiled by flocculent material forming.

Time will not permit me to speak of cleaning diatomaceous earths. They are at times exceedingly difficult to break up, and will require great patience and perseverance. The Barbadoes material, particularly, where there are traces of iron, may generally be best treated, first with concentrated solution of citric acid. Mr. Christian Febiger, I believe, is the first one to introduce the method of getting rid of sand. For general mounts of diatoms, I think a little sand not at all objectionable, as it holds up the cover-glass, and this frequently prevents the breaking of the most fragile specimens. The work with the mechanical finger is pleasant as well as profitable, as we are thus enabled frequently to save rare and valuable diatoms, and certainly we can study them in no other way. I prefer the "Rezner finger," with the modification of my friend, Mr. J. J. B. Hatfield, of Indianapolis, which prevents the least possible lateral motion of the finger.

In arranging geometric forms of diatoms, we have a guide-slide with micrometer circles. On this is placed the cover-glass, by moistening the surface of the guide-slide by breathing upon it; then centered with a pocket lens. The best fixing material for retaining the diatoms in position is that of Mr. Febiger, which is made as follows:

Glacial acetic acid,	f3xij.
Gelatine,	3ij.
Alcohol,	f3j.

Dissolve the gelatine in a Berlin dish by adding the acid over a water bath; then add the alcohol, and filter. I prefer a good, clean, *bright* amber gelatine to the perfectly transparent.

The fixing material is then spread across the face of the cover-glass by means of the finest cambric needle; a clean sweep of the needle is generally sufficient. The diatoms thus mounted rarely "float." Care should be taken in removing the cover-glass from the guide-slide lest it should break. This accident happened to me recently, in a mount I was preparing to present to this Society. The slide on which you wish to place your arranged diatoms is then fixed upon the turn-table, and a ring, the size of cover-glass, run on

with any aniline ink or color; the slide is then turned over, heated, and a drop of balsam placed upon it, and the cover-glass upon it, using as a guide the aniline ring, on the under side. If you have just enough balsam it will run neatly to the edge. To finish the slide have the wick of your alcohol lamp turned down to a small blue flame (after the manner of Prof. H. E. Smith's direction), to turn the slide over and move it regularly around the edge of the cover-glass, and you will have a beautifully beaded slide ready for handling as soon as it is cooled off. A slide thus prepared does not need a "baker" to finish it. I will be pleased to show any one interested in this kind of work what a "mechanical finger" will do, at our working-session.